

ABSTRACT OF THE DISCLOSURE

A novel lead zirconium titanate (PZT) material having unique properties and application for PZT thin film capacitors and ferroelectric capacitor structures, e.g., FeRAMs, employing such thin film material. The PZT material is scalable, being dimensionally scalable, pulse length scalable and/or E-field scalable in character, and is useful for ferroelectric capacitors over a wide range of thicknesses, e.g., from about 20 nanometers to about 150 nanometers, and a range of lateral dimensions extending to as low as 0.15 μm . Corresponding capacitor areas (i.e., lateral scaling) in a preferred embodiment are in the range of from about 10^4 to about $10^{-2} \mu\text{m}^2$. The scalable PZT material of the invention may be formed by liquid delivery MOCVD, without PZT film modification techniques such as acceptor doping or use of film modifiers (e.g., Nb, Ta, La, Sr, Ca and the like).